Is Botrychum dissectum a Sterile Mutant?

In answer to this query, first put by Prof. Chamberlain in the Botanical Gazette, and passed on by the JOURNAL to its readers, the following have been received.

In regard to *Botrychium dissectum*, I wish to call your attention to a find I made this September in Cass Co., Indiana, in a sandy black-white oak wood. I found a field of about three acres that had been cleared in the center of a large wood. This wood was until recently an Indian reservation. The cleared field was an old camping ground with a spring near the center. About the low place were elevated places which you might call hills, say about fifteen to twenty feet in height. The soil is very sandy. On the south side of the cleared field or opening and within fifty feet of the woods on the south side of the field and somewhat in the shade of a few small trees that have grown up, I found a single *B. obliquum*. I searched for more but could not find any. But there were literally hundreds of *B. dissectum* of all sizes. The associates were *Lechea villosa*, *Lechea* sp. *Potentilla canadensis*, *Spiranthes cernua*, *Sabatia angularis*, *Helianthemum*, *Agrimonia parviflora*, *Ceanothus*, *Viola* sp., *Poa* sp., *Panicum* sp., *Syntherisma* sp. and others. The Botrychium was growing commonly in a moss I took to be a species of Polytrichum or something like it. . . . .

I might say this is the first instance where I have found either *B. obliquum* or *dissectum* as common. I have never seen *B. dissectum* before except as an occasional plant. The same with *B. obliquum*, except in flat woods in the southern part of the state where it sometimes is found in goodly numbers.—C. C. DEAM, BLUFFTON, IND.

The above question, propounded and partially answered in a recent number of the Journal, will in all

probability be answered in various ways by different persons, depending upon the writer's idea as to what constitutes a valid species and what a mutant really is.

To the writer *B. dissectum* has never seemed to be a valid species but merely a variation in the depth of the marginal serrations of the ordinary *B. obliquum*. To see typical specimens of each in the herbarium is one thing and to see in the field, as any one who cares to do so may see, typical specimens of each species and a perfect series grading either way almost insensibly from one to the other, all growing within a few feet of each other, is another, giving an entirely different impression as to the validity of the species.

Before the relative numbers of the two species in any given area can be accurately determined, a definite agreement must be had as to just how far the cutting of the leaves must go before the plant is placed in the dissectum group. Until this is done different observers will give widely divergent answers as to the relative numbers of each species in the same colony or given area under observation.

To the writer it rather seems that person who made the observations in Ohio cited in the JOURNAL must have selected colonies suited to the particular purpose in mind and if this was not done the observer should have looked a little farther for there are many places where the ratio of the two species to each other is entirely different from that quoted, as the dissectum is many times more numerous, relatively speaking, than the citations would have us believe.

On Dec. 10 a small colony of plants was counted which showed 15 plants of the obliquum type to 13 of dissectum. These plants are to be found on a brier covered sandy knoll facing the west in an old orchard within the city limits of Kent. The colony does not extend over a space of more than 20 x 30 feet.

A smaller colony not over a mile away growing under about the same ecological conditions showed 10 obliquum to 7 dissectum in a space about 8 x 10 feet.

In each case all plants that were not typical obliquum were regarded as belonging to the dissectum group. Another observer taking a different view-point might arrive at an entirely different result after counting the same colonies of plants. We shall get nowhere in the matter of determining the frequency of occurrence of the two species until some definite standard of classification is adopted.

If dissectum is a valid species, will some one please tell us just how deep the laciniations must be to make it so? If it is a "sterile mutant" which is cause and which result— is it a mutant because it is sterile or sterile because it is a mutant and just what degree of sterility must a plant possess and what degree of laciniation must it have to become a mutant?—L. S. HOPKINS, KENT, O.

SOME FERNS SEEN IN CALIFORNIA—On July 3rd and 4th Mr. Robert Kessler and the writer went for a hike into the back part of the San Gabriel Range. Starting from Switzer's Camp, in the Arroyo Seco we went, via Barley Flats to Pine Flats, returning by way of the Trail Fork and West Fork of the San Gabriel River, around San Gabriel Peak, Mt. Markham and Mt. Lowe, to Alpine Tavern, on Mt. Lowe, where we took the trolley for Los Angeles. We did not collect many ferns but noted the following.

Filix fragilis (L.) Gilib. In a springy place in the south wall of Tejunga Canyon.

Polystichum munitum (Kaulf.) Presl. Frequent above 900 m. elevation. A single plant strongly resembling the var. *inciso-serratum* D. C. Eaton, except in that it